इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 13557-14 (1993): Information processing systems-Vocabulary, Part 14: Reliability, maintenance and availability [LITD 14: Software and System Engineering]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

(Reaffirmed 2003)

भारतीय मानक

सूचना प्रक्रमण तंत्र – शब्दावली

भाग 14 विश्वसनीयता, रखरखाव और उपलब्धता

Indian Standard

INFORMATION PROCESSING SYSTEMS — VOCABULARY

PART 14 RELIABILITY, MAINTENANCE AND AVAILABILITY

UDC 681·3·004·15 : 001·4

© BIS 1993

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 1993 **Price Group 2**

Information Systems and Software Sectional Committee, LTD 33

FOREWORD

This Indian Standard (Part 14) was adopted by the Bureau of Indian Standards, after the draft finalized by the Information Systems and Software Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

Assistance has been derived in formulating this standard from ISO/IEC DP 2382-14 'Information technology — Vocabulary — Part 14 : Reliability, maintenance and availability', issued by the International Organization for Standardization (ISO).

Indian Standard

INFORMATION PROCESSING SYSTEMS — VOCABULARY

PART 14 RELIABILITY, MAINTENANCE AND AVAILABILITY

1 SCOPE

1.1 This Standard (Part 14) covers the terms related to reliability, maintenance and availability.

2 RELIABILITY AND FAULTS

2.1 Product Assurance

The verification of the conformity of a product with applicable objectives, standards, specifications and other requirements throughout the life of the product.

2.2 Reliability

The ability of a *functional unit* to perform a required function under stated conditions for a stated period of time.

2.3 Durability

The ability of a *functional unit* to perform a required function under given conditions of use and maintenance, until the end of the useful life, or until it becomes unsuitable for economic or technological reasons.

2.4 Mean Time Between Failures (MTBF)

For a stated period in the life of a *functional unit*, the average interval of time between consecutive *failures* under stated conditions. This term is used for a repairable system.

2.5 Mean Time to First Failure (MTTF)

For a stated period in the life of a *functional unit*, the average time interval until a *failure* is expected to occur under stated conditions. This term is used for a non-repairable system.

2.6 Mean Time to Recovery (MTTR)

For a stated period in the life of a *functional unit*, the average time interval required for *corrective maintenance* under stated conditions.

2.7 Mean Down Time (MDT)

For a stated period in the life of a *functional unit*, the average value of the expected *down time* under stated conditions.

2.8 Mistake Error

A human action that can produce an unintended result. The term 'error' is defined in IS 1885 (Part 52/Sec 2) : 1980 Electrotechnical vocabulary : Part 52 Data processing, Sec 2 Arithmetic and logic operations.

2.9 Fault

An abnormal condition that causes a reduction in or loss of capability of a *functional unit* to perform its required function.

2.10 Failure

The termination of the ability of a *functional unit* to perform its required function.

2.11 Failure Rate

The frequency of *failures* of a *functional unit* per unit time.

2.12 Defect

The lack of or the deficiency in a characteristic essential in satisfying applicable requirements, which affects, or is likely to affect, the ability of a *functional unit* to perform its required function.

A defect is typically considered as built in during the design or manufacturing of a functional unit.

2.13 Program-Sensitive Fault

A fault that is revealed as a result of the *execution* of some particular sequence of *instructions.*

2.14 Data-Sensitive Fault

A *fault* that is revealed as a result of the processing of a particular pattern of *data.*

3 MAINTENANCE

3.1 Maintenance

A set of activities intended to keep a *functional unit* in, or to restore it to, a state in which it can perform its required function. Maintenance includes activities such as tests, measurements, replacements, adjustments and repairs.

3.2 Maintenance Tree

A graph showing the hierarchy of maintenance activities that can be performed on a *functional unit* and the conditions for choosing among them.

3.3 Maintainability/Serviceability

The ease with which *maintenance* of a *functional unit* can be prrformed in accordance with prescribed requirements.

3.4 Maintenance Support

The provision by a maintenance organization of the services required to maintain a *functional unit.*

3.5 Corrective Maintenance

Maintenance performed specifically to overcome existing *faults*.

3.6 Controlled Maintenance

The use of techniques to sustain a desired quality of service in order to minimize *preventive maintenance* and reduce *corrective maintenance*.

3.7 Preventive Maintenance

Maintenance performed specifically to prevent *failures* from occurring.

3.8 Scheduled Maintenance

Preventive maintenance carried out in accordance with an established time schedule.

3.9 Remote Maintenance

Maintenance performed over a communication link, with the assistance of, or under the control of, a maintenance facility in a separate location at which a higher level of knowledge and expertise is available.

3.10 Marginal Test/Marginal Check

A maintenance technique in which certain operating conditions are varied about their nominal values in order to detect or to locate potential *faults*.

3.11 Diagnostic

Pertaining to the detection, analysis, or description of *faults, failures,* or *mistakes*.

3.12 Microdiagnostic

A diagnostic technique by which a special purpose microprogram is incorporated in, or externally based as necessary, a *functional unit*.

3.13 Test and Maintenance Program

A *program* designed to test a *functional unit* primarily for the purpose of *maintenance* and verification operation.

4 AVAILABILITY

4.1 Availability

The ratio of the total *operable time*, excluding *maintenance time*, to the total time a *functianal unit* is required for use.

4.2 Serveability

The ability of a service to be obtained at the request of the user, and to continue to be provided for a requested duration within specific tolerances and under given conditions.

4.3 Operable Time

The time during which a *functional unit* is capable of yielding correct results, if operated.

4.4 Operating Time

That part of *operable time* during which a *functional unit* is operated.

4.5 Down Time

The time during which a *functional unit* cannot be used because of a *fault*. Down time can result from a fault within the functional unit or from an environmental fault; in the former case, the down time is also called the inoperable time.

4.6 Idle Time

That part of *operable time* when a *functional unit* is not being used.

4.7 Program Production Time

That part of *operating time* during which a user's *computer program* is executed.

4.8 System Test Time

That part of *operating time* during which the *functional unit* is tested for proper operation. Since a functional unit may consist of a *computer* and its *operating system*, system test time in some cases includes the time for testing *computer programs* belonging to the operating system.

4.9 Hot Standby

A configuration in which redundant equipment is kept in an operational mode so that it can be automatically brought into service should the primary equipment fail.

4.10 Reconfiguration

The modification of a configuration of a *functional unit* in the event of a *failure* or an error for the purpose of bringing that functional unit into a state in which it can perform its required function.

4.11 Cold Standby

A configuration in which redundant equipment is kept idle or performing secondary functions and can be manually brought into service should the primary equipment fail.

4.12 Fail Safe

A design property of a *functional unit* by which, in the event of a failure, it assumes a prescribed safe state.

4.13 Failsoft

Pertaining to a *computer system* continuing to function because of its *fault tolerance*.

4.14 Error Recovery

The process of correcting or bypassing. the effect of a *fault* to restore a *computer system* to a prescribed condition.

4.15 <TO> Retry

To repeat, for the purpose of *error recovery*, the *operation* which, in the event of an error, has not been normally completed.

4.16 Watchdog Timer

A circuit or *program* that ensured that a *functional unit* is operational by periodically generating a *signal* that, unless acknowledged by the unit within a prescribed period of time, activates an alarm or causes redundant equipment to take over.

4.17 <TO> Logout

To save into a *storage* the internal status of a *functional unit* in the event of a *failure* for the purpose of facilitating *maintenance*.

4.18 Logout Analysis

A process of analyzing the *logged out* information for the purpose of *fault* diagnostic.

4.19 Outage/Disabled State

A state in which a *functional unit* is unable to perform its required functioning.

4.20 Burn in

A process of increasing the *reliability* of new or refurbished hardware by operating it in a prescribed environment and by performing *corrective maintenance* at every *failure* encountered, with a view to eliminate as many early faults as possible.

4.21 Rerun Time

That part of *operating time* used for reruns due to *failures* or *mistakes* in operating.

4.22 Redundancy

In a *functional unit*, the existence of more than one means for improving *reliability* in addition to the essential set of means for performing the tequired function.

INDEX

NOTE — This index has been prepared in accordance with IS 1275 : 1958 'Rules for making alphabetical indexes'. Index numbers are clause numbers.

A

Availability **4.1**

B

Burn in **4.20**

C

Cold standby **4.11**

Controlled maintenance **3.6**

Corrective maintenance **3.5**

D

Data
  sensitive fault **2.14**
  defect **2.12**
  diagnostic **3.11**
  disabled state **4.19**
  down time **4.5**
  durability **2.3**

E

Error **2.8**
  recovery **4.14**

F

Fail safe **4.12**

Fail soft **4.13**

Failure **2.10**
  rate **2.11**

Fault **2.9**

H

Hot standby **4.9**

I

Idle time **4.6**

L

Logout analysis **4.18**

M

MDT **2.7**

Marginal
  check **3.10**
  test **3.10**

Mean
  down time **2.7**
  time to failure **2.5**
  time between failures **2.4**
  time to repair **2.6**
  time to recovery **2.6**

Maintainability **3.3**

Maintenance **3.1**
  tree **3.2**
  support **3.4**

Microdiagnostic **3.12**

Mistake **2.8**

MTBF **2.4**

MTTF **2.5**

MTTR **2.6**

O

Operable time **4.3**

Operating time **4.4**

Outage **4.19**

P

Product assurance **2.01**

Program
  sensitive fault **2.13**
  production time **4.7**

Preventive maintenance 3.7

R

Remove maintenance **3.9**

Reconfiguration **4.10**

Redundancy **4.22**

Reliability **2.2**

Rerun time **4.21**

Retry **4.15**

S

Scheduled maintenance **3.8**

Serveability **4.2**

Serviceability **3.3**

System test time **4.8**

T

Test and maintenance program **3.13**

U

Uptime **4.3**

W

Watchdog timer 4.16

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference :

Doc : No. LTD 33 (1572)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43, 53 16 40 53 23 84
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	632 92 95, 632 78 58 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.

Printed at Printrade, New Delhi, India